

Obstructive Sleep Apnea

General:

Abnormal breathing during sleep that causes: recurrent awakenings, daytime sleepiness, hypoxemia, impaired vigilance, impaired cognitive functioning, and reduced quality of life. Apnea is the absence of airflow for at least 10 seconds, and hypopnea is reduction (> 50%) in airflow for at least 10 seconds.

Symptoms:

- excessive daytime sleepiness
- impaired concentration
- snoring
- unrefreshing sleep
- choking episodes during sleep
- witnessed apneas
- restless sleep
- irritability / personality change
- nocturia
- decreased libido

Physical Exam clues:

wt and ht, neck circumference, mandible size, nasal patency, upper airway obstruction, macroglossia and dentition, pharyngeal appearance, BP

Epidemiology/risk factors:

The Wisconsin Sleep Cohort Study found prevalence rates of AHI (Apnea-Hypopnea Index) of more than five episodes per hour in 24 % of men and 9 % of women, and OSA with an index greater than five episodes per hour plus excessive sleepiness in 4 % of men and 2 % of women. It is estimated that OSA is present in 40% of obese adults and over 90% of morbidly obese adults. Other risk factors involving narrowing of the upper airway: obesity, certain craniofacial abnormalities, vocal cord abnormalities, enlarged tonsils, enlarged tongue. Other strong associated risk factors include increasing age and sex (male-to-female ratio is 2:1), hypothyroidism, acromegaly, menopause, family history, smoking, and nighttime nasal congestion.

50% of OSA patients are hypertensive and 30% of hypertensive patients have OSA. There is a 3-fold increased risk of developing new onset hypertension in patients with an Apnea Hypopnea Index (AHI, number of apnea-hypopnea events in an hour) of 15 or more. The JNC 7 includes OSA as an important cause of hypertension.

There is an association between OSA and Nocturnal complex arrhythmias (2 to 4-fold), independent of age, sex, BMI, and CAD. There is also an association with heart failure. OSA leads to negative intrathoracic pressure, which leads to the leftward shift of the interventricular septum, resulting in reduced end diastolic volume and increased left HF. CPAP has been shown to acutely reverse these effects. OSA is also associated with an increased prevalence of cardiovascular and cerebrovascular disease, as well as insulin resistance. A prospective cohort study showed that untreated male patients with severe OSA have significantly greater risks of fatal and nonfatal cardiovascular events (odds ratio, 2.87 and 3.17, respectively) than healthy controls. Patients with OSA also have an increased risk of MVA's, more than 1400 deaths annually in the U.S. Untreated OSA adds an estimated \$3.4 billion annually to U.S. health care costs. The relationship between OSA, excessive daytime sleepiness and road traffic accidents has been shown in driving simulator tests and in accident surveys, especially in truck drivers. Sleepiness causes 20% of MVA's and is associated with increased rates and severity of accidents. Driving performance is impaired, and accident rates increase with sleepiness.

Active CPAP treatment produced significant improvement in steering accuracy, maintenance of performance over time and reaction times.

Diagnostic Criteria:

Diagnosis of OSA = daytime symptoms associated with significant obstructive sleep-disordered breathing shown on polysomnography (study of sleep state, breathing, and oxygenation). Assess daytime sleepiness and AHI. Severe OSA = AHI greater than 30 episodes/hour + symptoms of excessive daytime sleepiness (e.g., Epworth Sleepiness Scale score of greater than 10; Multiple Sleep Latency Test result of less than five minutes).

1. AHI = (Apnea events + Hypopnea events)/ hours of sleep

<5 is normal

5 - 15 is Mild sleep apnea

15 -29 Moderate

30+ Severe

2. Epworth Sleepiness Scale

How likely are you to doze off or fall asleep in the following situations in contrast to just feeling tired? This refers to your usual way of life in recent times. Even if you have not done some of these things, try to work out how they would have affected you. Use the following scale to choose the most appropriate number for each situation.

0 = would never doze

1 = slight chance of dozing

2 = moderate chance of dozing

3 = high chance of dozing

Situation Chance of Dozing

Sitting and reading _____

Watching TV _____

Sitting inactive in a public place (eg a theatre or a meeting) _____

As a passenger in a car for an hour without a break _____

Lying down to rest in the afternoon when circumstances permit _____

Sitting and talking to someone _____

Sitting quietly after a lunch without alcohol _____

In a car, while stopped for a few minutes in traffic _____

Treatment and follow-up:

Treatment if mod. or severe (15 or more respiratory events per hour), long-term mortality increases above that level. Tx patients with five or fewer respiratory events/hour may if they complain of sleepiness and fatigue, or heart failure. Eliminate contributing factors and CPAP will improve sleep quality and reducing daytime sleepiness. Long-term treatment with CPAP reduces both mortality and hypertension.

1. (CPAP): Continuous Positive Airway Pressure has been shown to reduce daytime sleepiness compared with control treatments. Oral appliances are not as effective as CPAP. Mask fitting and titrate pressure to symptoms.

2. Weight Loss: Diet and exercise alone with weight loss of 20 lbs will improve sleep apnea significantly.

3. Sleep Hygiene: Sleep deprivation increases a person's propensity to snore. Only sex and sleep in bed. Do not watch television or use a computer the hour before going to bed. Regular sleep schedule. After 30 minutes of not being able to sleep, get up and do an activity such as washing dishes and then try again to fall asleep.

4. Treatment comorbidities: chronic rhinitis, nasal polyps, or septal deviation. Sedatives may cause snoring in persons who normally do not snore and can relax the tongue and parapharyngeal muscles. Raising the head of the bed and avoiding the supine position during sleep may decrease the incidence of apnea. Elevation of the head tends to bring the tongue forward, while sleeping on the side moves the tongue laterally. Patients with mild sleep apnea tend to respond best to conservative measures. Bariatric surgery may be an option for some patients.

5. An OSA evaluation should be done in all hypertensive patients, as effective treatment with CPAP has been shown to decrease systemic blood pressure.

Other lifestyle changes may help obstructive apnea:

- Limit ETOH, antihistamines, or tranquilizers.

- Tx allergies, colds or sinus problems.

- Gargle with salt water to shrink tonsils.

- Sleep on your side rather than your back, or with your body elevated from the waist up. You can use foam wedges to raise your upper body. Soft pillows may make it worse by pushing the chin toward the chest.

- Use an air humidifier at night.

- Don't smoke or expose yourself to other irritants, such as dust or perfumes.

Logistics at CCRMC:

In Epic order a sleep study based on insurance

- CCHP: Ambulatory sleep study at CCRMC, pt then sent to CPAP vendor who does CPAP trial including CPAP autotitration at home.

- Medi-Cal: Polysomnography at Doctors Medical Center or Contra Costa Sleep Center, will do CPAP titration.

Treatment of Obstructive Sleep Apnea in Primary Care

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Sleep-Disordered Breathing and CPAP Overview of Sleep-Disordered Breathing

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Sleep Disordered Breathing and Mortality: Eighteen-Year Follow-up of the Wisconsin Sleep Cohort

Terry Young, PhD1; Laurel Finn, MS1; Paul E. Peppard, PhD1; Mariana Szklo-Coxe, PhD1; Diane Austin, MS1;

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Scottish Intercollegiate Guideline for the Management of Obstructive Sleep Apnea/ Hypopnea Syndrome in Adults
June 2003, British Thoracic Society